VEASEY (C. A.)

THE USE OF SUBCONJUNCTIVAL INJECTIONS OF MERCURIC BICHLORIDE IN VARIOUS OCULAR AFFECTIONS,

WITH A REPORT OF FIFTEEN CASES SO TREATED.

Read before the Philadelphia County Medical Society, December 27, 1893.

BY

C. A. VEASEY, M.D.,

Clinical Assistant to the Ophthalmological Department of the Jefferson Medical College Hospital; Consulting Ophthalmic Surgeon to the Philadelphia Lying-in Charity and Nurse Training School.

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The Use of Subconjunctival Injections of Mercuric Bichloride in Various Ocular Affections, with a Report of Fifteen Cases so treated.

DURING the past two or three years much has been written concerning the subconjunctival injections of antiseptic solutions in various affections of the eye, especially by French surgeons, who are the strongest advocates of the method.

It is by no means a new procedure, for, as early as 1866, Rothmund* used a solution of sodium chloride in this manner for clearing up corneal opacities; and since this time, but more especially within the past four or five years, various surgeons have employed the method in the treatment of numerous ocular diseases.

Valude, the editor of the *Annales d' Oculistique*, in the early part of this year sent a communication to many oculists in different parts of the world, asking a number of questions in regard to the method, in order that proper conclusions could be formed by comparing the experiences of many. The results of this in-

* *Klinische Monatsblätter für Augenheilkunde*, 1866, p. 171.

quiry have been recently published,* and the experience of the large majority of the French surgeons included therein is in favor of the method.

It is not the purpose of the present paper to discuss the theory of subconjunctival injections and the value of the different drugs that have been employed in making them. Those interested are referred to the articles by Darier, which were published in the *Archives d' Ophthalmologie*, 1891, p. 449, and in the *Annales d' Oculistique*, April, 1893; also to the clinical lecture of Dr. de Schweinitz in the THERAPEUTIC GAZETTE, June, 1893.

The manner of making the injections is as follows: The conjunctival cul-de-sac is thoroughly cleansed with a freshly-made saturated solution of boric acid or with a solution of bichloride of mercury (1 to 8000), a few drops of a four-per-cent. solution of cocaine are instilled, and as soon as anæsthesia is produced the lids are separated by an assistant, while with a pair of fixation forceps the conjunctiva is seized about eight millimetres from the corneal margin, lifted up, and, the needle of the syringe having been inserted, the desired amount is forced out. The injection is made by Darier with a Pravaz syringe, but an ordinary hypodermic syringe, with a platinum needle, will answer the purpose very well. It is of the utmost importance, to be sure, that the barrel of the syringe be made thoroughly aseptic by the use of a strong solution of sublimate or carbolic acid; the needle should be brought to a red heat in the flame of an alcohol lamp prior

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* *Annales d' Oculistique*, August, 1893, p. 145.

to each injection, for a similar purpose. In fact, all the precautions against infection are taken just as if a corneal section were to be made.

If this be done, the danger of serious complications is reduced to a minimum. Slight chemosis follows each injection, but soon passes away. Occasionally a small conjunctival blood-vessel is punctured, giving rise to a considerable hemorrhage, but, beyond the discoloration thus produced, the accident is of little consequence. The cases of keratitis, or hypopyon keratitis, that have been reported as following an injection must have been due more to the imperfect sterilization of the instruments than to the operation itself. I have never seen such a complication.

The frequency of the injections, as well as the dose, depends upon the severity of the case. The strength of the solution employed is 1 to 1000, and the amount of the first injection about two minims. Much more than two minims has been given at a single injection, and repeated daily. But it seems to be generally conceded that it is better to begin with small doses, frequently repeated, say every other day, and to increase gradually the quantity injected as the idiosyncrasies of the patient are ascertained and the severity of the affection demands.

As to the number of injections to be made before the treatment should be abandoned, in case no improvement is observed after the first two or three have been given, no fixed rule can be followed. Darier says it is useless to continue after ten injections have been made if some improvement has not been noticed. On

the contrary, as many as fifty or sixty have been given in a single case, with improvement. But, generally, if any benefit will accrue from the use of this method, it will be noticeable after a few injections, and the length of time the treatment should be continued depends upon the progress of the case, each being a law unto itself.

The cases in which the method has been employed by various observers are widely different, but all surgeons seem to agree that it should not be used when there is present any vascular stasis sufficient to prevent the quick absorption of the remedy. The replies to Valude's letter of inquiry indicate that the best results are obtained in diseases of the uveal tract, chronic in nature, though there are also reports of excellent results having been obtained in diseases affecting other portions of the eye.

The following cases, reported by request of Dr. de Schweinitz, represent the diseases which have received the treatment in his service in the Jefferson Medical College Hospital:

Case I.—*Scleritis.*—B. S., female, aged forty-three, housekeeper, presented herself at the eye dispensary with a well-marked scleritis in the left eye. There were two large patches of infiltration, one above and one to the outer side of the cornea. The ciliary pain was intense and the cornea somewhat thickened. No history of syphilis or rheumatism. The vision of the right eye equalled $\frac{20}{20}$; of the left, $\frac{20}{100}$. After using both local and constitutional treatment for some time without any benefit, we had recourse to the subconjunctival injections of sublimate.

On the 28th of April 1½ minims were in-

jected just above the cornea and near the patch of infiltration. On May 1, three days later, the pain had entirely disappeared, the bulbar injection was almost gone, and the two patches of infiltration were much smaller. On this day an injection was made below the cornea. The patient did not return until May 12, saying she had felt so well she had thought it unnecessary to come earlier. There still being a little bulbar inflammation, however, a third injection was given, this time amounting to 2 minims. On May 20 the patient was to all appearances rid of the attack, and was dismissed from further attendance. Her vision on this date was for O. D., $\frac{20}{20}$; for O. S., $\frac{20}{30}$.

Case II.—*Syphilitic Serous Iritis* (*Keratitis Punctata*).—F. M., male, aged nineteen, morocco-worker; had an attack of gonorrhœa nine months before he presented himself for ocular treatment, followed a month later by a hard chancre. The ocular disease dates from this time. Treatment had been received during his first attack for three and a half months at another hospital. In each eye there were found traces of old iritic inflammation, and the corneas were infiltrated and hazy. Vision for O. D. equalled $\frac{20}{200}$; for O. S., $\frac{6}{200}$. On April 28 he was given an injection of sublimate beneath the conjunctiva, and between this time and August 14 he received fourteen injections. The vision on this date was for O. D., $\frac{20}{50}$; for O. S., $\frac{20}{200}$; a very great improvement.

Case III.—*Syphilitic Irido-Cyclitis*.—J. M., male, aged twenty-nine, driver, with well-marked irido-cyclitis in the right eye, of syphilitic origin, with a contracted pupil, pericorneal injection, intense pain, and numerous

posterior synechiæ, presented himself for treatment on April. 10. The usual treatment was given, including leeches to the temple; but on the 20th he did not seem to be any better. We then gave him an injection of sublimate, and on the 28th he was so much improved that another was given. On May 1, three days later, the ciliary inflammation was gone, the pupil round, and the vision, which before the treatment was for O. D. $\frac{20}{40}$ and for O. S. $\frac{20}{20}$, was now $\frac{20}{20}$ for each eye.

CASE IV.—*Corneal Ulcers.*—M. E., male, aged thirteen, tobacco-stripper, came on March 23 to obtain treatment for recurring phlyctenular ulcers of the left eye. There was one large infiltrated ulcer in the lower inner quadrant of the cornea, with several smaller ones surrounding it. Large maculæ existed as sequelæ of former ulceration. He received the customary treatment, and the ulcers healed very sluggishly.

Having presented himself with a third attack, he was given three injections of sublimate at proper intervals, the injections being made in that portion of the conjunctiva nearest the ulcers. They healed about as quickly as with the ordinary treatment, the disturbance after each injection being such that considerable time had to elapse before another could be given. After the treatment his vision was the same as when he was first seen.

CASE V.—*Syphilitic Plastic Iritis.*—M. J., male, aged thirty-five, coachman. Iritis in right eye of one week's duration. Intense ciliary injection, extreme tenderness, pupil small and immobile. There had been a papular eruption on his body some months before.

His vision was for O. D., $\frac{20}{70}$; for O. S., $\frac{20}{30}$. One injection of sublimate was given, and on the following day the tenderness had disappeared, the ciliary injection was very much diminished, and the pupil was large and round. After this the patient was not again seen; so whether he continued to improve so rapidly that he thought it unnecessary to come to the dispensary again, or whether he became worse and applied elsewhere for treatment is only a matter of conjecture.

CASE VI.—*Syphilitic Plastic Iritis.*—A. P., female, aged fifty-two, housekeeper. Iritis in right eye of three weeks' duration. Vision for O. D., $\frac{20}{200}$; for O. S., $\frac{20}{70}$. Pupil small and slightly oval horizontally, but immobile. Initial lesion ten years ago. Same eye inflamed twice before. Patient was given two injections of sublimate, after which the inflammatory symptoms had subsided, but there remained a slight attachment of the iris below. One month later a similar inflammation developed in the left eye, but one injection completely dissipated it, leaving no synechia.

CASE VII. — *Non-specific Parenchymatous Keratitis.*—J. B., male, aged twenty-eight, machinist, presented himself for treatment with a well-developed inflammation in the left eye, characterized by diffuse infiltration in the parenchyma of the cornea. The vision of this eye has always been poor, but a change for the worse was noticed four weeks ago. Denies any specific history. After a fair trial of internal and local medication, with very little improvement, he was given, at proper intervals, sixteen injections of sublimate. At the time the treatment was commenced his vision was for O. D., $\frac{20}{40}$, par-

tial, and for O. S., $\frac{20}{70}$. At the time of the last injection it was for O. D., $\frac{20}{40}$ and for O. S., $\frac{20}{30}$. The cornea of the left eye was comparatively clear. He had compound hypermetropic astigmatism, but the proper correction failed to make him see any lower on the test-card.

CASE VIII.—*Syphilitic Plastic Iritis.*—M. S., male, aged thirty, laborer. Iritis in right eye. Has had previous attacks. Patient is illiterate and a Russian, so it is impossible to obtain vision. One injection of sublimate reduced the inflammatory symptoms, leaving the pupil round and mobile.

CASE IX.—*Syphilitic Serous Iritis*—A. G., male, aged twenty-eight, laborer. Well-marked specific iritis, serous in type, in the right eye. There have been a number of previous attacks. Vision for O. D. is $\frac{20}{40}$ and for O. S., $\frac{20}{20}$. One injection was given, and two days later, when patient returned, the inflammation had subsided, the pupil was round, and the vision for each eye was $\frac{20}{20}$. Three months later this patient had another attack in the same eye, which was promptly checked by two injections.

CASE X.—*Interstitial Keratitis.*—F. A., male, aged twelve, presented himself with a most severe interstitial keratitis, of a scrofulous type, in both eyes. The lachrymation and photophobia were so great that it was impossible to measure his acuity of vision. He was given four injections of sublimate at differing intervals, his conjunctivitis being treated at the same time. At the expiration of this time—about two weeks—the patient left the hospital, but was much improved, readily counting fingers at twelve inches, both eyes being open and free from

irritation, although no change in the corneal infiltration had occurred.

Case XI.—*Interstitial Keratitis.*—P. L., female, aged seven. Has had badly-inflamed eyes since eight months of age, at which time there was present otitis media purulentia and a skin eruption covering almost the entire body. That peculiar variety of teeth to which Hutchinson's name has become attached is also present. The disease has been marked with frequent improvements and exacerbations. At the time the patient was first seen, the opaqueness of the cornea was so great that the pupils could scarcely be distinguished. Vision equalled the counting of fingers at six inches. In addition to the corneal inflammation there was a severe mucopurulent conjunctivitis and a chronic rhinitis. After the nasal and conjunctival inflammations had been somewhat reduced and internal medication had been employed, the vision became $\frac{2}{7}\frac{0}{0}$ for each eye. Subconjunctival injections of bichloride were now tried at three different times, but the eyes became so much worse after each trial, the vision being reduced to $\frac{2}{2}\frac{0}{0}\frac{0}{6}$ for each eye, that this form of treatment had to be abandoned. Internal medication combined with local measures are now being used, and the patient is still improving.

Case XII.—*Syphilitic Plastic Iritis.*—F. W., male, aged twenty-six, carpenter. Traces of old iritis in both eyes; now, a fresh attack in the left eye; initial lesion six months ago. Two injections of sublimate were sufficient to reduce the inflammatory symptoms.

Case XIII.—*Scleritis.*—M. D., female, aged twenty-eight, housekeeper, presented herself for treatment of a severe scleritis of ten days'

duration. Has had two previous attacks in the same eye, the first six years ago, the second two and a half years ago. Each time the attack lasted for several weeks. Tension is —2; patient is pregnant. After employing the usual means of treatment for three weeks, with no improvement, an injection of sublimate was given. On the following day the inflammation had subsided considerably and there was less pain. The improvement continued for four days, when another injection was given; but the reaction from the last one was so great, and the eye suddenly became so much worse, that this plan of medication was abandoned.

Case XIV.—*Gonorrhœal Iritis.*—J. R., male, aged twenty-five. Two years ago had gonorrhœal iritis, following an arthritis of the knee and ankle of like origin, exceedingly stubborn in character, lasting for many weeks. Present attack (May 1, 1893) confined to the right eye, beginning five days before examination. Typical plastic iritis, associated with violent pain. Vision $\frac{5}{15}$, barely. Two injections of the sublimate solution given respectively May 1, 1893, and May 5, 1893. Twenty-four hours after the first injection, iris free and pupil round. One week after second injection, irritation entirely subsided; vision $\frac{5}{9}$.

Case XV.—*Corneal Ulcer.*—J. K., male, aged sixty-one, presented himself for treatment May 15, 1893, with a large sloughing ulcer of the cornea in its lower portion and prolapse of the iris, the preserved portion of the anterior chamber being filled with blood and the bulbar conjunctiva swollen and œdematous; tension diminished; vision equals faint light perception. Atropine and boric acid or-

dered locally, and May 16, 1893, a subconjunctival injection of sublimate was given. Immediately afterwards intense pain and chemosis, which lasted for the rest of the day and during the night, and when he appeared the following day the eye was so swollen that the injection was not repeated. The ulcer was even more ragged and unhealthy than on the previous day. Under iodoform insufflations and a pressure bandage rapid healing took place.

To recapitulate, there were the following cases: 2 scleritis, 1 interstitial keratitis (scrofulous), 1 interstitial keratitis (specific), 1 parenchymatous keratitis (non-specific), 1 syphilitic irido-cyclitis, 2 syphilitic serous iritis, 4 syphilitic plastic iritis, 1 gonorrhœal iritis, 2 corneal ulcer.

In the two cases of scleritis the results in one were good, while in the other, after the first injection, they were negative.

In the interstitial keratitis of a scrofulous type the patient's condition was rapidly improving, but he discontinued the treatment.

In the specific interstitial keratitis the injections created such a disturbance that they had to be abandoned.

The case of non-specific parenchymatous keratitis was rapidly improved.

In the two cases of corneal ulceration, one was relieved of the inflammatory symptoms about as rapidly as with the ordinary method of treatment, while in the other the treatment was discontinued on account of the great degree of inflammation which followed the first injection.

In all the cases of iritis and in the case of

iridо-cyclitis the method gave prompt and effectual relief.

A solution of atropine was employed in each case from the beginning of the treatment; but in several of the cases of iritis it was used without result for several days, and on the day following an injection of sublimate, the synechiæ, as a rule, were broken and the pupils round.

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